

*REMARKS**The Office Action*

The Office Action sets forth the following grounds for rejection: (1) claims 1, 2, 11, 12, 13, 14, 16, 26, 35 and 44 are rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent 6,391,519 (Kunita); and (2) claims 5, 20, 29, 38, and 47 are rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Kunita in view of U.S. Patent 6,190,825 (Denzinger).

Discussion of Rejections

(1) Claims 1, 2, 11-14, 16, 26, 35 and 44 are rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Kunita. The Office Action states that Kunita discloses "a polymer comprising a phenolic monomeric unit (polymer II-(1)) wherein the H atom of the hydroxy group of the phenolic monomeric unit is replaced by a group Q (the group -X-Y'-Z'; see column 5 lines 49-52, column 31, lines 46-50 and 57-65; column 32 lines 1-24 and especially line 22 reciting the selection of an imide, which inherently includes N-imides) wherein L is a linking group (component X), wherein k is 0 or 1, wherein L is covalently bound to the O atom of the polymer when k is 1, or wherein the N atom of the N-imide group is covalently bound to the O atom of the polymer when k is 0 (see the structure of II-(1)), wherein X or Y are independently selected from O or S (when choosing an imide, X and Y are selected to be O), and wherein T¹ and T² represent a terminal group (when choosing an imide, T¹ and T² are inherently present, no matter which imide one chooses or which Z' (column 32, lines 55-67) one chooses)."

The Office Action concedes that Kunita fails to disclose that the group Q is an N-imide of the structure recited in claim 1 and acknowledges that "in the specific embodiment of Kunita cited here that a monovalent linking group Y' is not preferred (column 31, lines 58-60)". However, the Office Action alleges: "the groups Y' are selected because they are allegedly "known to cause a strong interaction with a phenolic hydroxyl group (column 31, lines 60-64)." Further, the Office Action alleges that in the first embodiment disclosed by Kunita, "the groups from which Y are chosen include monovalent linking groups, such as monovalent imides and, generically, any monovalent nitrogen compound (see the list of structures drawn on column 6 for Y¹). Kunita chooses these compounds specifically because of the strong interaction with the phenolic hydroxyl group (column 30, lines 13-18), which is the same reasoning for choosing those structures listed for

Y¹. Using these compounds/structures results in a film with a high density and an improved image recording material (column 30, lines 18-27). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to use an N-imide (a sub-genus of both the parent genera 'imide' and 'monovalent nitrogen compounds', which one having ordinary skill in the art could at once envisage) as the group Y' in the second embodiment (II-(1)) of Kunita in order to achieve a film with a high density."

Applicants respectfully traverse the rejection and submit that the Office Action has failed to make a *prima facie* case for obviousness.

First, some comments regarding polymer II-1 of Kunita: Kunita discloses an image recording material or photosensitive resin composition comprising (as shown in the Abstract):

(A-1) a phenolic polymer having a structural unit represented by the following general formula I-(1) on a polymer backbone;

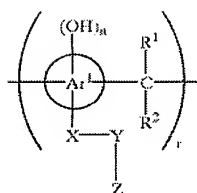
(A-2) a polymer which has a structural unit represented by the following general formula II-(1) as a polymer backbone or a structural unit represented by the following general formula II-(2) as a side chain attached to a polymer backbone and which has a phenolic hydroxyl group; or

(A-3) a mixture comprising a polymer having a phenolic hydroxyl group and a polymer which has a structural unit represented by the following general formula II-(1) as a polymer backbone or a structural unit represented by the following general formula II-(2) as a side chain of attached to a polymer backbone;

and (B) an infrared ray absorbing agent.

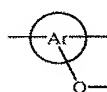
Thus, Kunita teaches that the photosensitive resin composition can be (1) a combination of a phenolic polymer (A-1) and an infrared ray absorbing agent B; (2) a combination of polymer (A-2) and an infrared ray absorbing agent B; or (3) a combination of a polymer mixture (A-3) and an infrared ray absorbing agent B.

The phenolic polymer A-1 requires that it contains a phenolic hydroxyl group as shown in formula I-(1):

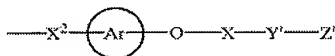


I-(1)

The polymer A-2 has (a) a polymer having a backbone represented by formula II-(1) and further containing phenolic hydroxyl groups OR (b) a polymer having a side chain represented by formula II-(2) and further containing phenolic hydroxyl groups. Thus, A-2 always contains phenolic hydroxyl groups. Formulas II-(1) and II-(2) are set forth below:



II-(1)

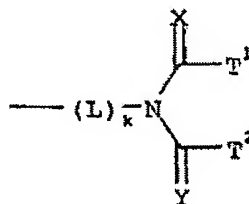


II-(2)

The combination A-3 includes a mixture of two polymers: (1) a polymer having phenolic hydroxyl groups and a polymer having a backbone of formula II-(1) OR (2) a polymer having phenolic hydroxyl groups and a polymer having a side chain of formula II-(2). Thus, the A-3 composition always contains phenolic hydroxyl groups.

The foregoing shows that in all of the embodiments of Kunita, phenolic hydroxyl groups have to be present in the photosensitive resin composition.

The Office Action admits that Kunita fails to disclose the group Q is an N-imide and has the structure:



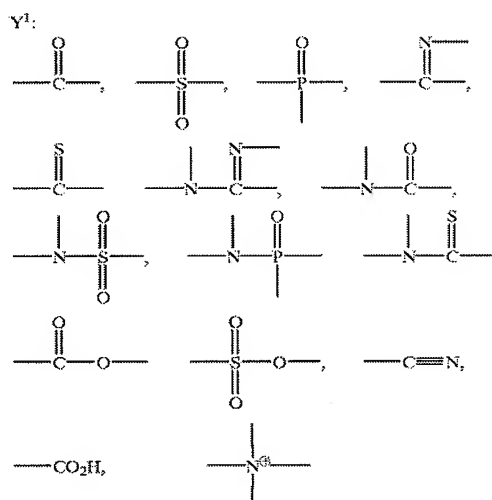
The Office Action states "that it is noted that in the specific embodiment of Kunita cited here that a monovalent linking group Y' is not preferred (column 31, lines 58-60)". Applicants respectfully submit that this is an erroneous statement. At column 31, lines 58-60, Kunita states: "The partial structures listed in the following Y'¹ group are each a *divalent*

linking group provided with a dissociative hydrogen atom.” (Emphasis added). Kunita never said anything about monovalent linking groups or that monovalent linking groups are less preferred. That Kunita states that monovalent linking group is less preferred is clearly an erroneous interpretation of the prior art on the part of the Office Action. When the prior art teaches that “Y” represents a *divalent linking* group linked to Z” (col. 31, line 57; emphasis added), those of skill in the art would not read a monovalent linking group. A linking group by definition has to be of di- or higher valence so as to be able to link two or more moieties. How can a monovalent group link two moieties? It can never be monovalent as the Office Action contends. There is no scientific and legal basis for the Office Action to make this argument. There is a clear failure in making a *prima facie* case for obviousness.

The Office Action continues: “in the first embodiment disclosed by Kunita, the groups from which Y are chosen include monovalent linking groups, such as monovalent imides and generically, any monovalent nitrogen compound (see the list of structures drawn on column 6 for Y¹).” Again, this is an erroneous statement on the part of the Office Action, and the statement includes multiple errors, each of which is discussed below.

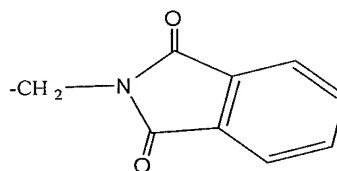
The first embodiment disclosed by Kunita includes a polymer of formula I-(1). At col. 6, Kunita discloses that “Y represents either a linking group linked to Z described later of a terminal group terminated with a hydrogen atom. When Y represents a linking group, the group may be of *any valence between divalent and quadrivalent* and is a group known to produce a strong interaction with a phenolic hydroxyl group. More specifically, Y has any of the following partial structures.” (Emphasis added). Kunita specifically teaches that the valence of the linking group is between divalent and quadrivalent. Kunita does not teach monovalent linking groups as the Office Action contends. The Office Action reads too much into the art erroneously.

The structures disclosed at col. 6, for Y¹ are:



Those of skill in the art would, beyond any doubt, will attest to the fact that the above structures are divalent or multivalent linking groups except for $\text{—CO}_2\text{H}$ and $\text{—C}\equiv\text{N}$, which are monovalent terminal groups. These monovalent terminal groups do not suggest to those of

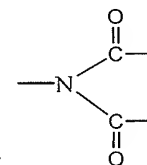
ordinary skill in the art an imide group, for example, SR-01 at page 14).



(arising from

Turning to the statement by the Office Action that the structures disclosed in col. 6 by Kunita includes monovalent imides generically, Applicants submit this is another example of the many errors in the Office Action. As discussed, except for the terminal groups, all of the structures shown are divalent linking groups, not monovalent groups. Further, the structures shown in col. 6 do not include an imide group. It is known to those skilled in the art that an

imide group has two carbonyl (C=O) groups attached to one nitrogen (N) atom:



The structures shown in col. 6 do not contain such a structure. In fact, there is only one structure that shows a carbonyl group attached to a nitrogen atom (the structure >N—C(=O)—) found between lines 25 and 30 of col. 6). This only structure is an amide (not imide) as those

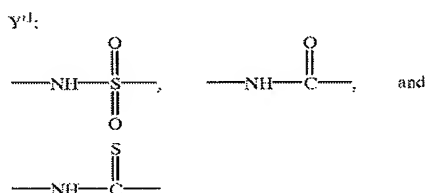
of skill in the art would understand. How can an amide structure include an imide structure as the Office Action argues? It is impossible. Clearly, there is an error in the Office Action.

Furthermore, col. 6 contains 8 structures containing nitrogen atom. How can this disclosure of mere 8 specific structures, six of which are *divalent or multivalent*, include *any monovalent nitrogen compound*, as the Office Action contends? Without any doubt, there is no basis for such contention. The Office Action is again in error. Clearly, Kunita's structures cannot include or suggest the substituted imide of the presently claimed invention.

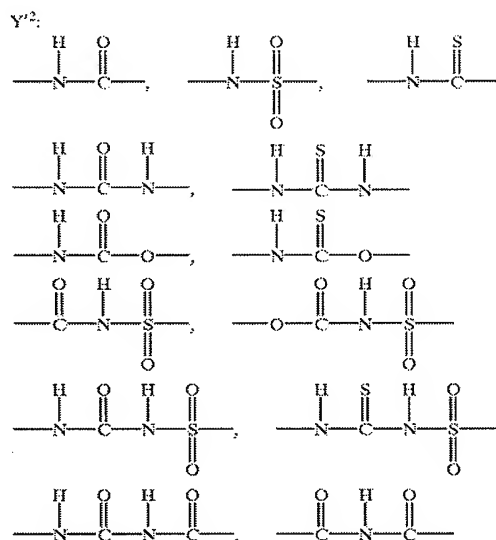
Next, the Office Action points to Kunita, col. 31, lines 60-64 and contends that "the groups Y' are selected because they are known to cause a strong interaction with a phenolic hydroxyl group". The Office Action then points to the monovalent linking groups shown in col. 6 for Y¹, and argues that "Kunita chooses these compounds specifically because of the strong interaction with the phenolic hydroxyl group (column 30, lines 13-18), which is the same reasoning for choosing those structures listed for Y¹". The Office Action further contends: "Since X may include a phenolic hydroxyl group (column 6, lines 1-10), at the time of the invention, it would have been obvious to one having ordinary skill in the art could at one envisage as the group Y' in the second embodiment (II-(1)) of Kunita in order to achieve a film with a high density."

Applicants respectfully submit that the above contention is flawed. Kunita teaches at col. 31, lines 60-64 that the Y'¹ groups "are each a divalent linking group provided with 'a dissociative hydrogen atom'." Kunita defines the term "a dissociative hydrogen atom" as "a hydrogen atom which is dissociative in a pKa range of from 4 to 15 and is known to cause a strong interaction with a phenolic hydroxyl group". As discussed, Kunita's disclosure does not include monovalent linking groups; more specifically, Kunita does not suggest the substituted imide of the presently claimed invention.

Further, the divalent linking groups shown in col. 32 for Y'¹ are:



and the structures shown in col. 32 for Y'² are:



Each of the above structures includes a dissociative hydrogen atom on the nitrogen. Even though Kunita clearly teaches that a dissociative hydrogen atom is needed to form a strong interaction with a phenolic hydroxyl group, and based on the structures disclosed for Y, the dissociative hydrogen atom is the H of the NH in the various structures disclosed, the Office Action contends that it would be obvious to one of ordinary skill in the art to place an imide group which does not have a dissociative hydrogen. This argument flies in the face of the express teachings of the reference. When there is no dissociative hydrogen atom, how can it form a strong interaction? Such a substitution of a group having a dissociative hydrogen atom with a different group which does not have a dissociative hydrogen atom is contrary to the express teachings of the cited reference, for that reason alone the obviousness rejection should be removed.

Further, it is clear to those skilled in the art that the modification proposed by the Office Action will not work for the intended purpose of the cited reference. It is well established law that motivation to modify the prior art (as the Office Action has argued here) would be lacking where the proposed modification would destroy the intended function of the cited reference. See, e.g., *In re Fritch*, 23 USPQ2d 1780 (Fed. Cir. 1992), note 23 at 1783 (“A proposed modification is inappropriate for an obviousness inquiry when the modification renders the prior art reference inoperable for its intended purpose”). See also, *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), where the prior art strainer had an orientation that relied, in

part, on gravity to separate dirt and water from gasoline, and no motivation would have existed to turn this strainer upside down. Indeed, “if the prior art apparatus were turned upside down, it would be rendered inoperable for its intended purpose”. *Id* at 1127. The Court continued that the gasoline would be trapped inside the apparatus, while water would flow out of the outlet and the dirt would become clogged, requiring another pet-cock at the new bottom of the device. Holding that the prior art, in effect, taught away from the Board of Appeals and Interference’s proposed modification, the Federal Circuit reversed the obviousness rejection.

Turning to the rejection in hand, as discussed, Kunita requires that a dissociative hydrogen atom on the linking group (Y). The purpose of this dissociative hydrogen atom is to cause a strong interaction (col. 31, lines 59-65). The strong interactions, according to Kunita, lead to several advantages; see col. 30, lines 13-27. Without these strong interactions, such interactions would be absent. The film formed (if at all it forms without the strong interactions) will not have high density or improved intra-film transmissivity of heat obtained by the light-to-heat conversion at the time of laser exposure. Further, the sensitivity of the image recording material cannot be achieved. Furthermore, the image recording material will not be less susceptible to external influences such as humidity and temperature. Consequently, the storage stability of the image recording material will not be enhanced. In essence, the Office Action proposed modification would destroy Kunita’s invention. This is a clear case of erroneous obvious rejection. Accordingly, the rejection should be removed.

Moreover, Applicants respectfully submit that they have proceeded against the conventional wisdom of the prior art, namely, prepared a polymer that *lacks* the dissociative active hydrogen atom on nitrogen, which the prior art states to be a *requirement*. It is well established that proceeding against conventional wisdom is a “strong evidence of unobviousness”. *In re Hedges*, 228 USPQ 685, 687 (Fed. Cir. 1986); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 220 USPQ 303 (Fed. Cir. 1983) (prior art teaching that conventional polypropylene should have *reduced crystallinity* before stretching and should undergo *slow stretching* led away from claimed process of producing porous article by expanding *highly crystalline* PTFE by *rapid stretching*); accord, *In re Fine*, 5 USPQ2d 1596, 1599 (Fed. Cir. 1988). Accordingly, there is a strong evidence the presently claimed invention is non-obvious, and the rejection should be withdrawn.

Applicants respectfully submit that the Office Action's attempt at an alternative way of finding motivation also is erroneous. The Office Action states: "The specific functional group for the second embodiment of Kunita (X-Y'-Z') is chosen because it exhibits a strong interaction to create a hydrogen bond with an adjacent phenolic hydroxyl group in the polymer (column 39, lines 12-15) in order to create a film with a high density (column 39, lines 19-20). It is an inherent property of monovalent nitrogen that it will create hydrogen bonds with nearby hydroxyl groups. Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to use an N-imide (a sub-genus of both the parent genera 'imide' and 'monovalent nitrogen compounds', which one having ordinary skill in the art could at once envisage) as the group Y' in the second embodiment (II-(1)) of Kunita in order to achieve a film with a high density."

The above argument of the Office Action must fail for several reasons. The specific functional group -X-Y'-Z' in the second embodiment polymer of formula II-(1), as described in Kunita, "has an active hydrogen atom dissociative in a pKa range of from 4 to 15" (col. 39, lines 11-13). Kunita continues: "Therefore, the specific functional group -X-Y'-Z' exhibits a strong interaction to create a hydrogen bond with an adjacent phenolic hydroxyl group in the polymer and can increase the permeation of a developing solution into films at the same time" (col. 39, lines 13-17). The above clearly refers to functional groups Y' wherein a dissociative hydrogen atom is present such as the Y'¹ and Y'² groups set forth at column 32, lines 1 to 54, all of which show that there is a hydrogen (H) atom on the nitrogen (N). Thus, Kunita teaches that an NH is a requirement for causing strong interaction and for forming high density film. Kunita does not teach that a disubstituted imide such as the presently claimed invention can provide this strong interaction.

The Office Action's argument that it is an inherent property of the monovalent nitrogen that it will create hydrogen bonds with nearby hydroxyl groups is unsupported and baseless at the minimum, and runs counter to the express teachings of the prior art reference. Kunita does not disclose that monovalent nitrogen forms the hydrogen bond. Kunita clearly teaches that the hydrogen atom (H) attached to the nitrogen forms a hydrogen bond with the phenolic OH group. Kunita does not teach that the monovalent nitrogen atom forms a hydrogen bond. The Office Action has failed to justify its assertion of inherency. The Office has a high burden in proving inherency, which cannot be taken lightly. The Court of Appeals for the Federal Circuit and its predecessor Court of Customs and Patent Appeals have set forth strict and clear guidelines for the PTO to show inherency. Inherency cannot be predicated even on "probabilities" and

“possibilities.” Inherency is justifiable only when the asserted inherent property necessarily flows from the disclosure. *Continental Can Co. USA, Inc. v. Monsanto Co.*, 20 USPQ2d 1746 (Fed. Cir. 1991); *In re Oelrich*, 212 USPQ 323 (CCPA 1981). The nature of the disclosure is such that it is indeed the opposite; the ability to form strong interaction necessarily cannot and does not flow from the disclosure. A silk purse cannot be made from a sow’s ear. The Office Action has clearly failed to meet its burden. Accordingly, the obviousness rejection should be withdrawn.

Further, as discussed, there is no basis for the Office Action’s assertion that it would have been obvious to one having ordinary skill in the art to use an N-imide (a sub-genus of both the parent genera ‘imide’ and ‘monovalent nitrogen compounds’, which one having ordinary skill in the art could at once envisage) as the group Y’ in the second embodiment (II-(1)) of Kunita in order to achieve a film with a high density.

Furthermore, the law requires, in order to justify an obviousness rejection of a composition of matter claim, that the prior art must teach a method of making the claimed composition. See, e.g., *In re Hoeksema*, 158 USPQ 596 (CCPA 1968), where the Court emphasized that the process of making a compound forms part of the “invention as a whole” approach in the determination of obviousness. The Court went on to state that “where the record establishes that no known or obvious method of making the compound exists, the compound itself is patentable”. *Hoeksema*, at 601. Clearly, the record establishes that the prior art does not teach a method of preparing the N-imide containing polymers of the presently claimed invention. Accordingly, the obviousness rejection should be withdrawn.

In regards to claims 5, 20, 29, 38, and 47, the Office Action alleges that these claims are unpatentable over Kunita in view of Denzinger (US 6,190,825). The Office Action alleges that “as discussed above in the rejection of claims 1, 2, and 12, respectively, an N-imide group is chosen, but a specific imide is not.” However, the Office Action alleges that Denzinger teaches using phthalidimides in polymers for lithographic printing plate in abstract and in col. 6, lines 3-34 to improve the run length and chemical resistance of the plate. The Office Action contends that it would have been obvious to one having ordinary skill in the art to use a phthalidimide as the imide group in the modified embodiment of Kunita in order to improve the run length and chemical resistance of the plate. The Office Action further states that when using phthalidimide, the above

limitations are met when $m = 0$, X and Y are O, and R^{14} and R^{15} form an aromatic 6-membered ring. Applicants respectfully submit that the Office Action is again in error.

Combining the N-substituted maleimide or the phthalidimide of Denzinger with the composition of Kunita would destroy the intended purpose of the primary reference. Kunita requires a dissociative hydrogen atom on the nitrogen. Denzinger teaches a molecule which clearly lacks this requirement. In view of the foregoing, the combination of Kunita with Denzinger is forbidden.

Even if Denzinger's maleimide polymer becomes a phthalidimide under the conditions argued by the Office Action, the nitrogen atom of the imide group is not linked to the oxygen atom of the phenolic hydroxyl (in a phenolic resin). This is a requirement under the claimed invention. In Denzinger, the backbone of the polymer is C-C and the N atom of the imide is attached to the back bone of the polymer through carbon atoms. There is no phenolic oxygen linking the N atom of the imide. Thus, even if someone skilled in the art makes the combination for the sake of argument, the resulting combination would not result in the claimed polymer. The Office Action cannot simply take two references that show partial pieces of the claimed molecule and combine them and provide the missing elements or groups so as to make the claimed molecule. This is called the classic hindsight reconstruction, there being no suggestion to provide the missing pieces of the claimed molecule. Such blatant hindsight reconstruction is clearly forbidden by the law.

The obviousness rejection is also contrary to *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. Supreme Court 2007), and the guidelines established by the USPTO for determining obviousness. The invention here is not one of combining prior art elements according to known methods to yield predictable results. The N-disubstituted imide of the claimed invention is not a prior art element as Kunita fails to disclose such an imide. The prior art also does not show a method of making (synthesizing) such polymers. There is no reasonable expectation that the polymer with such an imide group can be arrived at, especially in view of the teaching in the art that a dissociative active hydrogen atom is required on the nitrogen and that the dissociative active hydrogen is required to provide hydrogen bonding with a phenolic hydroxyl group.

The presently claimed invention also is not a simple substitution of one known element for another to obtain predictable results. The polymer containing the N-disubstituted imide is not a result of a simple substitution of one known element with another known element. As discussed,

the presently recited imide is not in the cited prior art. The results also cannot be predicted since the required dissociative active hydrogen atom is missing in the claimed invention. The presently claimed invention also is not the use of a known technique to improve a similar product. It also is not an obvious to try situation. Applicants did not choose from a finite number of identified, predictable solutions with reasonable expectation of success. The chosen imide has never been identified by the cited prior art. It also cannot be a predictable solution in view of the requirement in the art of a dissociative active hydrogen atom on nitrogen.

“Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), quoted with approval by *KSR*, 82 USPQ2d at 1396. The Office Action failed to meet its burden under *KSR* and the USPTO guidelines. Accordingly, the rejection must fall.

In view of all of the foregoing, Applicants respectfully submit that the presently claimed invention is non-obvious, and the obviousness rejections should be withdrawn.

Conclusion

A favorable decision is solicited. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



Xavier Pillai, Reg. No. 39,799
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson Avenue
Chicago, Illinois 60601-6731
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

Date: May 13, 2008